

EIC 3600

Dialog Search

Set of Items & Description

S1 481146 REVERSE? OR BACKWARD? OR INVERSE? OR CONVERSE? -  
S2 30 -(STAR OR SNOWFLAKE OR SNOW()FLAKE)(1W) (SCHEMA? OR SCHEME? -  
OR QUERY OR QUERIES)  
S3 208858 DATABASE? OR DATABANK? DATAWAREHOUS? OR DATA() (WAREHOUS? OR  
MART? ? OR STORE? ? OR BASE OR BASES OR BANK? ? OR SYSTEM?) -  
OR MDDB OR OODB OR DBMS  
S4 0 S1 AND S2  
? show files  
File 344:Chinese Patents Abs Aug 1985-2005/May  
(c) 2005 European Patent Office  
File 347:JAPIO Nov 1976-2005/Feb(Updated 050606)  
(c) 2005 JPO & JAPIO  
File 350:Derwent WPIX 1963-2005/UD,UM &UP=200544  
(c) 2005 Thomson Derwent

EIC 3600

Dialog Search

Set	Items	Description
S1	481146	REVERSE? OR BACKWARD? OR INVERSE? OR CONVERSE?
S2	30	(STAR OR SNOWFLAKE OR SNOW() FLAKE) (1W) (SCHEMA? OR SCHEME? - OR QUERY OR QUERIES)
S3	208858	DATABASE? OR DATABANK? DATAWAREHOUS? OR DATA() (WAREHOUS? OR MART? ? OR STORE? ? OR BASE OR BASES OR BANK? ? OR SYSTEM?) - OR MDDB OR OODB OR DBMS
S4	2794633	POPULAT??? OR GENERAT??? OR ESTABLISH??? OR CREAT???
S5	0	S1(3N) S2
S6	0	S1(S) S2
S7	22	S2 AND S3
S8	0	S7 AND S1

? show files

File 344:Chinese Patents Abs Aug 1985-2005/May

(c) 2005 European Patent Office

File 347:JAPIO Nov 1976-2005/Feb(Updated 050606)

(c) 2005 JPO & JAPIO

File 350:Derwent WPIX 1963-2005/UD,UM &UP=200544

(c) 2005 Thomson Derwent

JMB

Date: 13-Jul-05

EIC 3600

Dialog Search

Set	Items	Description
S1	3880	AU=(CHEN, L? OR CHEN L?)
S2	102	S1 AND IC=G06F-017?
S3	31	S2 AND (DATABASE? OR DATABANK? DATAWAREHOUS? OR DATA() (WAREHOUSE? OR MART? ? OR STORE? ? OR BASE OR BASES OR BANK? ? OR - SYSTEM?) OR MDDB OR OODB OR DBMS)
S4	6	S3 AND ((STAR OR SNOWFLAKE OR SNOW() FLAKE) (1W) (SCHEMA? OR - SCHEME? OR QUERY OR QUERIES) )

? show files

File 344:Chinese Patents Abs Aug 1985-2005/May

(c) 2005 European Patent Office

File 347:JAPIO Nov 1976-2005/Feb(Updated 050606)

(c) 2005 JPO & JAPIO

File 350:Derwent WPIX 1963-2005/UD, UM &UP=200544

(c) 2005 Thomson Derwent

File 348:EUROPEAN PATENTS 1978-2005/Jun W04

(c) 2005 European Patent Office

File 349:PCT FULLTEXT 1979-2005/UB=20050707, UT=20050630

(c) 2005 WIPO/Univentio

*Search for  
patents*

4/5/1 (Item 1 from file: 349)  
DIALOG(R)File 349:PCT FULLTEXT  
(c) 2005 WIPO/Univentio. All rts. reserv.

01008692 \*\*Image available\*\*

**SPATIAL INTELLIGENCE SYSTEM AND METHOD**  
**SYSTEME SPATIAL DE RENSEIGNEMENT ET PROCEDE CORRESPONDANT**

Patent Applicant/Assignee:

METAEDGE CORPORATION, 1257 Tasman Drive, Suite C, Sunnyvale, CA 94089, US  
, US (Residence), US (Nationality)

Inventor(s):

CHEN Li-Wen , 7725 Oak Meadow Court, Cupertino, CA 95014, US,  
LUU Victor, 2805 Vista Del Valle, Morgan Hill, CA 95037, US

Legal Representative:

JOSEPHSON Daryl C (et al) (agent), Squire, Sanders & Dempsey L.L.P., 600  
Hansen Way, Palo Alto, CA 94304-1043, US,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200338684 A1 20030508 (WO 0338684)

Application: WO 2002US3854 20020201 (PCT/WO US0203854)

Priority Application: US 2001348463 20011029; US 200117701 20011214

Designated States:

(Protection type is "patent" unless otherwise stated - for applications  
prior to 2004)

AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ  
EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR  
LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL  
TJ TM TR TT TZ UA UG UZ VN YU ZA ZW  
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR  
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG  
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW  
(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class: G06F-017/30

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 12442

English Abstract

The present invention provides techniques for analyzing and managing information having a spatial component (106). Techniques such as virtual schemas (601) can be used to create meta models for analyzing spatial information, in conjunction with information about other centric entities, including business entities, technical entities, and governmental entities. Specific embodiments provide systems, methods, computer programs and apparatus for populating databases (101) in accordance with the defined meta models (401) and analyzing information having spatial components in a variety of business, technical and governmental applications.

French Abstract

La presente invention concerne des procedes d'analyse et de gestion d'information a composante spatiale (106). On peut recourir a des techniques telles que les schemas virtuels (601) pour creer des meta-modeles d'analyse de l'information spatiale, en relation avec de l'information concernant d'autres entites, et notamment des entites appartenant au monde du commerce, de l'industrie ou de la technique, et des administrations d'etats. Certains modes de realisation concernent des

systemes, des procedes, des logiciels et des appareils permettant de peupler des bases de donnees (101) en fonction des meta-modeles definis (401) et d'analyser l'information a composantes spatiales dans le cas de diverses applications du monde du commerce, de l'industrie ou de la technique, et des administrations d'etats.

Legal Status (Type, Date, Text)  
Publication 20030508 A1 With international search report.

**4/5/2 (Item 2 from file: 349)**  
DIALOG(R)File 349:PCT FULLTEXT  
(c) 2005 WIPO/Univentio. All rts. reserv.

00948082 \*\*Image available\*\*

**METHOD AND SYSTEM FOR DECISION SUPPORT ANALYSIS**  
**PROCEDE ET SYSTEME D'ANALYSE D'AIDE A LA DECISION**

Patent Applicant/Assignee:

METAEDGE CORPORATION, 1257 Tasman Drive, Suite C, Sunnyvale, CA 94089, US  
, US (Residence), US (Nationality)

Inventor(s):

CHEN Li-Wen , 7725 Oak Meadow Court, Cupertino, CA 95014, US,  
SHENG Rounda, 21791 Heber Way, Saratoga, CA 95070, US

Legal Representative:

DURDIK Paul A (et al) (agent), Squire, Sanders & Dempsey L.L.P., 600  
Hansen Way, Palo Alto, CA 94304-1043, US,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200282209 A2-A3 20021017 (WO 0282209)

Application: WO 2001US27200 20010830 (PCT/WO US0127200)

Priority Application: US 2001827969 20010404

Designated States:

(Protection type is "patent" unless otherwise stated - for applications prior to 2004)

AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ  
EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR  
LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL  
TJ TM TR TT TZ UA UG UZ VN YU ZA ZW  
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR  
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG  
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW  
(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class: **G06F-017/60**

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 10809

**English Abstract**

The present invention provides techniques for managing and analyzing business information. Specific embodiments, a first plurality of information is modeled using a first logical model (1101). The logical model is converted into a first derived subject model (1102). The first derived subject model is converted into the first physical model (1103). The model also includes mapping at least one relationship among the first plurality of information in the **database** based upon the first physical model (1104). Dynamic attributes and profiles can be derived (1105). The method also includes defining analyses based on available applications

(1106). A check can be performed in some specific embodiments, to determine if a user would like to iteratively perform the method again to refine the model (1107).

**French Abstract**

La presente invention concerne des techniques de gestion et d'analyse d'informations de gestion. Des modes de realisation specifiques proposent des modeles permettant aux responsables de gestion ou d'autres activites non techniques de comprendre et de manipuler les relations entre diverses entites de donnees des bases de donnees. Des modes de realisations specifiques concernent diverses applications. On dispose ainsi de modeles pluridimensionnels, de calculs statistiques, de systemes a base de regles, de generateurs de comptes rendus, et analogues, que l'on peut utiliser pour divers modes de realisation specifiques, de facon a permettre au decisionnaire de decider, d'analyser et de proposer des relations entre diverses entites d'information.

**Legal Status (Type, Date, Text)**

Publication 20021017 A2 Without international search report and to be republished upon receipt of that report.

Search Rpt 20030821 Late publication of international search report  
Republication 20030821 A3 With international search report.

**4/5/3 (Item 3 from file: 349)**

DIALOG(R)File 349:PCT FULLTEXT

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00893388 \*\*Image available\*\*

**METHOD AND SYSTEM FOR MANAGING EVENT ATTRIBUTES****PROCEDE ET SYSTEME DE GESTION D'ATTRIBUTS D'EVENEMENTS****Patent Applicant/Assignee:**

METAEDGE CORPORATION, 1257 Tasman Drive, Suite C, Sunnyvale, CA 94089, US  
, US (Residence), US (Nationality)

**Inventor(s):**

CHEN Li-Wen , 7725 Oak Meadow Court, Cupertino, CA 95014, US

**Legal Representative:**

DURDIK Paul A (et al) (agent), Squire, Sanders & Dempsey L.L.P., 600  
Hansen Way, Palo Alto, CA 94304-1043, US,

**Patent and Priority Information (Country, Number, Date):**

Patent: WO 200227528 A1 20020404 (WO 0227528)

Application: WO 2001US29801 20010924 (PCT/WO US0129801)

Priority Application: US 2000235390 20000925; US 2000235373 20000925; US  
2001309214 20010731; US 2001309633 20010801; US 2001963062 20010924; US  
2001963145 20010924

**Designated States:**

(Protection type is "patent" unless otherwise stated - for applications prior to 2004)

AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ  
EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR  
LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL  
TJ TM TR TT TZ UA UG UZ VN YU ZA ZW

(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR

(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG

(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class: **G06F-017/00**

International Patent Class: **G06F-017/30 ; G06F-013/00; G06F-015/18**

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 16315

English Abstract

The present invention provides techniques for managing and analyzing business information (100) comprising a computer system (102), coupled to database (101), a metadata repository (110). Specific embodiments provide persons with business or other non-technical fields with the capability to create, edit, and work with data models, profiles, and reports for business and other information. Specific embodiments can enable business and other non-technical users with enhanced understanding of information, and greater capabilities to manipulate relationships between various data entities in databases , for example.

French Abstract

L'invention concerne des techniques de gestion et d'analyse d'informations commerciales (100), lesquelles mettent en oeuvre un systeme informatique (100), couple a une base de donnees, ainsi qu'un service d'archivage de metadonnees (110). Des modes de realisation specifique fournissent a des personnes des domaines commerciaux ou non techniques, et offrent a celles-ci la possibilite de creer, editer des modeles de donnees, profils et rapports destines a des informations commerciales ou autres, et de travailler a l'aide de ces modeles, profils et rapports. D'autres modes de realisation specifiques permettent a des utilisateurs commerciaux ou non techniciens une meilleure comprehension des informations et des possibilites accrues de manipulation des relations entre diverses entites de donnees, dans des bases de donnees, par exemple.

Legal Status (Type, Date, Text)

Publication 20020404 A1 With international search report.

Withdrawal 20020926 Withdrawal of priority claims after international publication: US 09/963,145 20010924

Examination 20030109 Request for preliminary examination prior to end of 19th month from priority date

**4/5/4 (Item 4 from file: 349)**

DIALOG(R)File 349:PCT FULLTEXT

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00743943 \*\*Image available\*\*

**METHOD FOR DYNAMIC CUSTOMER PROFILING IN DATABASE**

**PROCEDE PERMETTANT D'ETABLIR LE PROFIL DYNAMIQUE D'UN CLIENT DANS UNE BASE DE DONNEES**

Patent Applicant/Assignee:

METAEDGE CORPORATION, Suite 245, 2620 Augustine Drive, Santa Clara, CA 95054, US, US (Residence), US (Nationality)

Inventor(s):

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FENG Hwa Chung, 20372 Silverado Avenue, Cupertino, CA 95014, US

Legal Representative:

YEE George B F, Townsend and Townsend and Crew LLP, Two Embarcadero Center, 8th floor, San Francisco, CA 94111-3834, US

Patent and Priority Information (Country, Number, Date):

Patent: WO 200057312 A1 20000928 (WO 0057312)

Application: WO 2000US7814 20000322 (PCT/WO US0007814)

Priority Application: US 99125721 19990323; US 2000532366 20000321

Designated States:

(Protection type is "patent" unless otherwise stated - for applications prior to 2004)

AE AG AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW

(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE

(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG

(AP) GH GM KE LS MW SD SL SZ TZ UG ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class: G06F-017/30

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 6953

English Abstract

According to the present invention creating and accessing customer information (402) in a **database**, **data mart** or **data warehouse**, segmenting customer information into one or more groups of customers (404), having one or more attributes. The segmenting can be based upon a value for the attribute of interest. Defining one or more profiles (406) are part of the method, a profile can comprise one or more groups, analyzing customer information (408) for a plurality of users, evaluating to specific values used to select which group a particular customer belongs, mapping to specific customer groups based on segment code values assigned to the various groups of customers.

French Abstract

L'invention concerne la creation de et l'accès à des informations (402) sur des clients dans une base de données, un dépôt de données ou un magasin de données, ainsi que la segmentation desdites informations en un ou plusieurs groupes de clients (404) possédant un ou plusieurs attributs. La segmentation peut être basée sur une valeur affectée à l'attribut d'intérêt. Le procédé comprend la définition d'un ou de plusieurs profils (406), un profil pouvant comprendre un ou plusieurs groupes; l'analyse des informations sur les clients (408) pour une pluralité d'utilisateurs; l'évaluation par rapport à des valeurs spécifiques utilisées pour sélectionner le groupe auquel appartient un certain client; et la mise en correspondance avec des groupes spécifiques de clients sur la base de valeurs de code segmentaire affectées aux divers groupes de clients.

Legal Status (Type, Date, Text)

Publication 20000928 A1 With international search report.

Publication 20000928 A1 Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

Examination 20001207 Request for preliminary examination prior to end of 19th month from priority date

4/5/5 (Item 5 from file: 349)  
DIALOG(R)File 349:PCT FULLTEXT

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00579159      \*\*Image available\*\*  
**METHOD FOR PROVIDING A REVERSE STAR SCHEMA DATA MODEL**  
**PROCEDE PERMETTANT DE REALISER UN MODELE DE DONNEES POUR SCHEMA EN ETOILE**  
**INVERSEE**

Patent Applicant/Assignee:

**METAEDGE CORPORATION,**

CHEN Li-Wen,

ORTIZ Juan J,

Inventor(s):

CHEN Li-Wen

ORTIZ Juan J

Patent and Priority Information (Country, Number, Date):

Patent: WO 200042532 A1 20000720 (WO 0042532)

Application: WO 2000US906 20000113 (PCT/WO US0000906)

Priority Application: US 99116086 19990115; US 99306677 19990506; US 99306650 19990506; US 99306693 19990506

Designated States:

(Protection type is "patent" unless otherwise stated - for applications prior to 2004)

AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB  
GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA  
MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA  
UG US US US US UZ VN YU ZA ZW GH GM KE LS MW SD SL SZ TZ UG ZW AM AZ BY  
KG KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE  
BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG

Main International Patent Class: G06F-017/30

Publication Language: English

#### Fulltext Availability:

### Detailed Description

## Claims

Fulltext Word Count: 11569

### English Abstract

According to the invention, techniques for organizing information from systems in a **data warehousing** environment are provided. In an exemplary embodiment, the invention provides a method for analyzing data from one or more data sources of an enterprise data (204). The method provides a meta-model based technique for modeling the enterprise data (204). The enterprise is typically a business activity (203), but can also be other loci of human activity. Embodiments according to the invention can translate data from a variety of sources (203, 204) to particular **database** schema in order to provide organization (200-204) to a **data warehousing** environment.

## French Abstract

La presente invention concerne des techniques permettant d'organiser l'information en provenance de systemes fonctionnant dans un environnement d'entreposage electronique massif. L'invention concerne plus particulierement un procede permettant d'analyser les donnees d'au moins une source situee dans les donnees (204) d'une entreprise. Le procede est en fait un procede a base de meta-modele conçu pour la modelisation des donnees (204) d'une entreprise. Cette entreprise est generalement une entreprise (203) commerciale, mais elle peut egalement s'interesser a d'autres domaines de l'activite humaine. Des realisations de l'invention permettent la traduction des donnees d'une multiplicité de sources (203, 204) pour qu'elles s'insèrent dans le schema particulier d'une base de donnees de facon a conferer une organisation (200-204) a un

environnement d'entreposage electronique massif.

**4/5/6 (Item 6 from file: 349)**  
DIALOG(R)File 349:PCT FULLTEXT  
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00579157 \*\*Image available\*\*

**METHOD FOR VISUALIZING INFORMATION IN A DATA WAREHOUSING ENVIRONMENT**  
**PROCEDE DE VISUALISATION D'INFORMATIONS DANS UN ENVIRONNEMENT DE DEPOT DE**  
**DONNEES**

Patent Applicant/Assignee:

METAEDGE CORPORATION,  
CHEN Li-Wen,

Inventor(s):

CHEN Li-Wen

Patent and Priority Information (Country, Number, Date):

Patent: WO 200042530 A1 20000720 (WO 0042530)  
Application: WO 2000US1075 20000113 (PCT/WO US0001075)  
Priority Application: US 99116016 19990115; US 2000483385 20000113; US  
2000483182 20000113; US 2000483386 20000113

Designated States:

(Protection type is "patent" unless otherwise stated - for applications prior to 2004)

AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB  
GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA  
MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA  
UG US US US UZ VN YU ZA ZW GH GM KE LS MW SD SL SZ TZ UG ZW AM AZ BY  
KG KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE  
BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG

Main International Patent Class: **G06F-017/30**

Publication Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 11780

**English Abstract**

According to the invention, techniques for visualizing customer data (103) contained in **databases** (6), **data marts** and **data warehouses** (8). In an exemplary embodiment, the invention provides a method for graphically analyzing relationships in data (103) from one or more data sources of an enterprise. The method can be used with many popular visualization tools (21), such as a On Line Analytical Processing (OLAP) tools (2) and the like. The method is especially useful in conjunction with a meta-model (103) based technique for modeling the enterprise data. The enterprise is typically a business activity (21), but can also be other loci of human activity (10). Embodiments according to the invention can display data from a variety of sources in order to provide visual representations of data in a **data warehousing** environment (8).

**French Abstract**

L'invention concerne des techniques permettant de visualiser des donnees (103) de client contenues dans des bases (6) de donnees, des magasins et des depots (8) de donnees. Dans un mode de realisation exemplaire, l'invention concerne un procede permettant d'analyser graphiquement des relations entre des donnees (103) provenant d'une ou de plusieurs sources de donnees d'une entreprise. Le procede peut etre utilise avec de nombreux outils (21) de visualisation populaires, tels des outils (2) de

traitement analytique en ligne (OLAP) et analogue. Le procede est specialement utile conjointement avec une technique de metamodeles (103) pour la modelisation des donnees d'entreprise. L'entreprise est generalement une activite (21) commerciale, mais peut egalement concerner d'autres activites (10) humaines. Les modes de realisation de l'invention permettent d'afficher des donnees provenant de diverses sources pour fournir des representations visuelles de donnees dans un environnement (8) de depot de donnees.

EIC 3600

Dialog Search

Set      Items      Description  
S1      475930      REVERSE? OR BACKWARD? OR INVERSE? OR CONVERSE?  
S2      113      (STAR OR SNOWFLAKE OR SNOW() FLAKE) (1W) (SCHEMA? OR SCHEME? -  
              OR QUERY OR QUERIES)  
S3      194904      DATABASE? OR DATABANK? DATAWAREHOUS? OR DATA() (WAREHOUS? OR  
              MART? ? OR STORE? ? OR BASE OR BASES OR BANK? ? OR SYSTEM?) -  
              OR MDDB OR OODB OR DBMS  
S4      9      S1(S)S2  
S5      8      S4 AND S3

? show files

File 348:EUROPEAN PATENTS 1978-2005/Jun W04

(c) 2005 European Patent Office

File 349:PCT FULLTEXT 1979-2005/UB=20050707,UT=20050630

(c) 2005 WIPO/Univentio

5/3/K/1 (Item 1 from file: 349)

DIALOG(R) FILE:349 PCT FULLTEXT

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01091779 \*\*Image available\*\*

SPATIAL INTELLIGENCE SYSTEM AND METHOD

PROCEDE ET SYSTEME D'INTELLIGENCE SPATIALE

Patent Applicant/Assignee:

METAEDGE CORPORATION, 1257 Tasman Drive, Suite C, Sunnyvale, CA 94089, US  
US (Residence), US (Nationality)

Inventor(s):

CHEM Li Wen, 7725 Oak Meadow Court, Cupertino, CA 95014, US,

Legal Representative:

DURDIK Paul A (et al) (agent), Squire, Sanders & Dempsey L.L.P., 600  
Hansen Way, Palo Alto, CA 94304-1043, US,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200413739 A2-A3 20040212 (WO 0413739)

Application: WO 2003US24456 20030805 (PCT/WO US03024456)

Priority Application: US 2002401268 20020805

Designated States:

(Protection type is "patent" unless otherwise stated - for applications prior to 2004)

AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ  
EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR  
LS LT LU LV MA MD MG MK MN MW MX MZ NI NO NZ OM PG PH PL PT RO RU SC SD  
SE SG SK SL SY TJ TM TN TR TT TZ UA UG UZ VC VN YU ZA ZM ZW  
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT RO SE  
SI SK TR

(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG

(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Publication Language: English

Filing Language: English

Fulltext Word Count: 14234

Fulltext Availability:

Detailed Description

Claims

English Abstract

...user's particular application requirements, deducing from the meta model(s) meta data, and populating databases with data objects in accordance with the meta data derived from the defined meta model...

Detailed Description

... user's particular application requirements, deducing from the meta model(s) meta data, and populating databases with data objects in accordance with the meta data derived from the defined meta model...

...of the present invention, a method

is provided. The method comprises receiving a first schema database comprising

information having at least one of a spatial component and a remaining component. Performing...

...in persistent, semi-persistent, or non-persistent storage in various applications.

Aggregating data of the database into one or more groupings in accordance with the meta data is also part of...

derived attributes.

...system I 00

for managing and analyzing information comprises a computer system 200, coupled to database 101, a metadata repository 106, and an optional input/output device(s) 158, which can...

...like. In specific embodiments, metadata repository 106 may be combined with or co-located with database 101. In some specific embodiments, one or both of metadata repository 106 and database 101 may be located on the computer system 200, while in alternative embodiments, one or both of metadata repository 106 and database 101 may be located on another computer system (not shown), which may be...

...embodiments, a network- may connect computer system 200 with a server computer having access to database 101 and/or metadata repository 106, so that a client-server relationship is...

...processes resident on computer system 200 provides various functions to the user. For example, a database interface software process 155 maintains the information in the database 101. A query/command generator software process 156 provides access to the information in the database 101. A scheduler software process 154 coordinates the events and actions in the computer system...

...of the present invention. As shown by Fig. 4A, an architecture diagram 400 comprises of database 101 that contains information about a business process in a specific embodiment. The database 101 contains a plurality of data elements. The data contained within database 101 may be organized in a variety 10 of different ways, which may be called schema. In a specific embodiment, database 101 is a relational database . A physical model 401 conceptualizes relationships between various data elements within database 101. Physical models, such as, for example relational models, provide one or more...

...a customer, a 1 5 transaction, a product, and so forth, stored in the relational database 101.

Representative examples of physical models will be described herein with reference to...

...Fig. 4D. Physical model 401 is representative of relationships between and among information within the data warehouse 101. One or more virtual schemas, or subject models, such as subject model 301 may...

...to represent the concepts underlying the physical model 401. Subject model 301 comprises a reverse star schema (RSS) relationship among a plurality of data elements stored in the database 101. Other types of virtual schemas may be used in various specific embodiments. Subject model 301 provides a way for users and consumers of the data in database 101 to think about the relationships among the data in a useful way...

...analyses. Logical model 201 provides a way for users and consumers of the data in database 101 to view relationships between different data elements in the database 101 in a

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hierarchical way. Representative examples of logical models will be...

Fig. 6A can support a multiple subject system, in which different applications run using the data stored in the database 101.

Accordingly, more than one subject model and more than one subject view  
...

...301 comprises a plurality of relationships between a plurality of groups and information entities in database 101, as illustrated by logical model 201. Logical model 201 provides a...

...a specific embodiment, the entities comprising the derived subject model 301 have a reverse star schema arrangement, with the suspect entity 432 comprising a core component 420, as indicated by a...

...between entities of suspect, incident, and location that are incorporated in information stored in the database 101. In a specific embodiment, the database is a relational database, however, other methods of storing and retrieving information may be used in...

...attributes and profiles from static data based upon a virtual schema, such as a reverse star schema, for example, and to create a star schema, and, hence a multidimensional cube, dynamically.

The physical model 401 comprises a suspect entity 402...

...601 comprises a plurality of relationships between a plurality of groups and information entities in database 101, and illustrated by logical model 501, which provides a location...

...In a specific embodiment, the entities comprising the derived subject model 601 have a reverse star schema arrangement, with the location entity 537 comprising a core component 520, as indicated by a...

...between entities of suspect, incidents, and locations that are incorporated in information stored in the database 101. In a specific embodiment, the database is a relational database, however, other methods of storing and retrieving information may be used in various other specific...As illustrated in flowchart 601 of Fig. 6A, the process includes receiving a first schema database 602. Then, a virtual schema is formed 604. The virtual schema includes at least a portion of a dataset included within the first 30 database. A first input indicating a criterion is received 606. Then, data of the database is aggregated into one or more groupings in accordance with the virtual schema and the...

...As illustrated in flowchart 609 of Fig. 6E, the process can provide receiving a second database 642. A virtual schema including at least a portion of a dataset included within the first database and the second database can be formed 644. A first input indicating a criterion is received 646. The data of the first database and/or the second database may be aggregated into one or more groupings in accordance with the virtual schema and...

...As illustrated in flowchart 611 of Fig. 6F, the process includes receiving a first schema database comprising information having one or both of a spatial component and a remaining component 652...

...654. The geospatial pattern is stored as meta data 656.

mapping rule based upon analysis of information in the data warehouse

20 The system of claim 19 wherein:  
the source comprises at least one of a plurality of on line  
1 5 transaction processing (OLTP) databases .  
21 An apparatus, comprising:  
means for generating one or more virtual schemas including at least...  
...the meta data.  
41  
. A computer program product, comprising:  
code for receiving a first schema database comprising information  
having at least one of a spatial component and a remaining component;  
code...  
...code for storing the geospatial pattern as meta data;  
code for aggregating data of the database into one or more  
groupings in accordance with the meta data;  
code for displaying one...

5/3,K/2 (Item 2 from file: 349)

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01008692 \*\*Image available\*\*

**SPATIAL INTELLIGENCE SYSTEM AND METHOD**  
**SYSTEME SPATIAL DE RENSEIGNEMENT ET PROCEDE CORRESPONDANT**

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Detailed Description

Claims

**English Abstract**

...entities, and governmental entities. Specific embodiments provide systems, methods, computer programs and apparatus for populating databases (101) in accordance with the defined meta models (401) and analyzing information having spatial components...

**Detailed Description**

... U.S. Nonprovisional Patent Application Serial No. 10/017,701, entitled, "System For Providing A Reverse Star Schema Model," filed, December 14, 2001.

**BACKGROUND OF THE INVENTION**

The present invention relates generally to...entities, and governmental entities. Specific embodiments provide systems, methods, computer programs and apparatus for populating databases in accordance with the defined meta models and analyzing information having spatial components in a...of the present invention, a method is provided. The method comprises receiving a first schema database . Forming a virtual schema including at least a portion of a dataset included within the first database is also part of the method. The method also includes receiving a first input indicating a criterion. Aggregating data of the database into one or more groupings in accordance with the virtual schema and the first input...criterion is also part of the method. The method can include aggregating data of the database into one or more new groupings in accordance with the redefined virtual schema and the...is also part of the method. The method can also include aggregating data of the database into one or more new groupings in accordance with the virtual schema and displaying one...

...of proximities, and the like.

In specific embodiments, the method further comprises receiving a second database . A virtual schema including at least a portion of a dataset included within the first database , the second database , or both is formed. The method also includes receiving a first input indicating a criterion. Aggregating data of the first database , the second database , or both, into one or more groupings in accordance with the virtual schema and the...method further comprises providing customer centric information to a core of customer data within the database in accordance with the virtual schema.

5 Specific embodiments can thereby provide maps of information...

...of the present invention, a method is provided. The method comprises receiving a first schema database . A virtual schema that includes at least a portion of a dataset included within the first I O database is formed. The method also includes receiving a first input indicating a criterion. A second ...one or more regions may be received. The method also includes aggregating data of the database into one or more groupings in accordance with the virtual schema, the first input indicating...of data input from a source, and generates mapping rules controlling data movement into a data warehouse . A metadata repository holds the virtual schemas and mapping rules. A data warehouse builder, a spatial-object data repository, a region checker and an n-dimensional presentation mechanism are also part of the system. The data warehouse is defined by at least a portion of the data input, the virtual schemas, the...source. The apparatus also includes means for generating mapping rules controlling data movement into a data warehouse and means for holding the virtual schemas and mapping rules. Means for

generating one...also included in the program product. As is code for scheduling tasks for managing a **data warehouse**. The program product also includes code for pre-processing data for movement into the **data warehouse** and code for managing creation of the **data warehouse**. Code for defining customer data analysis functions can be part of the program product also...Code for translating entities from a meta model into a data schema to form a **database** is also part of the computer program product. Code for providing customer activity correlation queries with access to a **database** of a **data warehouse** can be included in the program product as well. The program product also includes ...the customer activity

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components. The focal group and the customized group comprise a reverse **star schema** meta model.

Numerous benefits are achieved by way of the present invention over conventional techniques...

...aware 5 infrastructure in which spatial entities and attributes may be used in conjunction with **data warehousing** and data mining techniques to provide insight into business, technical, and governmental processes. Specific embodiments according to the present invention bring spatial data into the mainstream business world, the **data warehousing** environment, and decision-support systems environments.

#### Data

**warehousing** applications in accordance with specific embodiments of the present invention can transform data into useful...embodiment of the present invention.

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Fig. 7 illustrates a conceptual diagram of a representative **database** in a specific embodiment of the present invention.

Fig. 8 illustrates a conceptual diagram of...entities, and governmental entities. Specific embodiments provide systems, methods, computer programs and apparatus for populating **databases** in accordance with the defined meta models and analyzing information having spatial components in a...

...the term "information" refers to data, raw or processed, that can be stored in a **database**, **data mart**, or **data warehouse**, for example. The term "intelligence" refers to an understanding developed from information, for example. ...in specific embodiments of the present invention. As illustrated by Fig. IA, data from a **data warehouse** 101 is provided to an information aggregator 102. The information aggregator 102 aggregates information from the **data warehouse** 101 subject to a criterion 103 for display on an n-dimensional...to dynamically derive attributes and profiles from static data and virtual schemas to create a **star schema database**, and, hence a multidimensional geographic display of the static data, dynamically. Reference maybe had to...

...coping U.S. patent application serial number 09/306,677, entitled, "Method For Providing A Reverse Star Schema Model," to LiWen Chen, et al., which is incorporated herein by reference in its entirety analyze

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information. Specific embodiments provide **Reverse Star Schema** meta models in which spatial-centric applications can be readily deployed.

However, the present invention... of the aggregated data from the information aggregator 102 based upon the spatial-object meta data stored in spatial-object meta data repository 106.

In a specific embodiment, n-dimensional presentation 104...events.

In specific embodiments, one or more spatial extensions may be added to objects in **data warehouse**'s IO 1 in order to make use of geographical tools. Data objects may include...

...For example, attributes may be added to centric entities and/or activity entities in the **data warehouse** IO 1, whenever you are using C-Insight to import **database** objects to populate the repository.

Fig. IC illustrates a further representative spatial analysis system in ...plurality of relationships between the spatial analysis components illustrated by Fig. IA, such as the **data warehouse** IO 1, information aggregator 102, criterion 103, and n-dimensional presentation area 104. As shown by Fig. IC, **data warehouse** comprises a plurality of information entities, such as entities 402 and 507, for example, associated in the **data warehouse** IO 1. Physical schemas 401 and 701 are described with reference to particular specific embodiments...

...more virtual schemas 601 and 301, that map various relationships between information entities in the **data warehouse** IO 1 of interest to users.

Virtual

I I

schemas can be defined, redefined, or...

...suit the wants or desires of consumers of intelligence developed from the information within the **data warehouse** 101. Fig. IC illustrates a location centric virtual ...the core component 520. This type of arrangement of information entities is termed a "Reverse Star Schema ." One or more derived attributes 97 may be determined from relationships between non-location information entities and location information entities within the **data warehouse** IO 1, of which location entity 93, non-location entity 94 are illustrative. Derived attributes...

...transactions, occurrences, segmentations, profiles, calculations, and the like determined from the information in the **data warehouse** IO 1. Derived attributes determined from information having a spatial component, such as location entity...components in the virtual schema 601. The information can be stored in the spatial meta data store 106 in some specific embodiments. The region information can be used to redefine segmentation the underlying information in the data warehouse IO 1.

Fig. IE illustrates a still further representative spatial analysis system 5 in a...

...analyzer 107 provides aggregation of information from the analyzer 102 based upon the spatialobject meta data stored in the spatial meta data repository 106. Region analyzer 107 can provide dynamic updating of ...a system 100 for managing and analyzing information comprises a computer system 200, coupled to **database** IO 1, ...like. In specific embodiments, metadata repository 106 may be combined with or co-located with **database** IO 1. In some specific embodiments, one or both of metadata repository 106 and **database** 101 may be located on the computer system 200, while in alternative embodiments, one or both

1 3

of metadata repository 106 and database 101 may be located on another computer system (not shown), which may be a...embodiments, a network may connect computer system 200 with a server computer having access to database 101 and/or metadata repository 106, so that a client-server 5 relationship is...

...processes resident on computer system 200 provide various functions to the user. For example, a database interface software process 155 maintains the information in the database 101. A query/command generator software process 156 provides access to the information in the database 101. A scheduler software process 154 ...of the present invention. As shown by Fig. 4A, an architecture diagram 400 comprises of database 101 that contains information about a business process in a specific embodiment. The database 101 contains a plurality of data elements. The data contained within database 101 may be organized in a variety of different ways, which may be called schema. In a specific embodiment, database 101 is a relational database . A physical model 401 conceptualizes relationships between various data elements within database 101. Physical models, such as, for example relational models, provide one or more relationships stored in

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the relational database 101. Representative examples of physical models will be described herein with reference to specific embodiments...

...Fig. 4D. Physical model 401 is representative of relationships between and among information within the data warehouse 101. One or more virtual schemas, or subject models, such as subject model 301...

...to represent the concepts underlying the physical model 401. Subject model 301 comprises a reverse star schema (RSS) relationship among a plurality of data elements stored in the database 101. Other types of virtual schema may be used in various specific embodiments. Subject model 301 provides a way for users and consumers of the data in database 101 to think about the relationships among the data in a useful way. Representative data in database 101 to view relationships between different data elements in the database 101 in a hierarchical way. Representative examples of logical models will be described herein with using the data stored in the database 101. Accordingly, more than one subject model and more than one subject view may...301 comprises a plurality of relationships between a plurality of groups and information entities in database 101, as illustrated by logical model 201. Logical model 201 provides a suspect centric view...In a specific embodiment, the entities comprising the derived subject model 301 have a reverse star schema arrangement, with the suspect entity 432 comprising a core component 420, as indicated by a...between entities of suspect, incident, and location that are incorporated in information stored in the database 101. In a specific embodiment, the database is a relational database , however, other methods of storing and retrieving information may be used in various other specific...attributes and profiles from static data based upon a virtual schema, such as a reverse star schema , for example, and to create a star schema , and, hence a multidimensional cube, dynamically.

The physical model 401 comprises a suspect entity 402...601 comprises a plurality of relationships between a plurality of groups and information entities in database 101, and illustrated by logical model 501, which provides a location centric...In a specific embodiment, the entities comprising the derived subject model 601 have a reverse star schema arrangement, with the location entity 15537 comprising a core

component 4520, as indicated, between entities of suspect, incidents, and locations that are incorporated in information stored in the **database**

23

. In a specific embodiment, the **database** is a relational **database**, however, other methods of storing and retrieving information may be used in various other specific...As illustrated in flowchart 601 of Fig. 6A, the process includes receiving a first schema **database** 602. Then, a virtual schema is formed 604. The virtual schema includes at least a portion of a dataset included within the first **database**. A first input indicating a criterion is received 606. Then, data of the **database** is aggregated into one or more groupings in accordance with the virtual schema and the...As illustrated in flowchart 609 of Fig. 6E, the process can provide receiving a second **database** 642. A virtual schema including at least a portion of a dataset included within the first **database** and the second **database** can be formed 644.

A first input indicating a criterion is received 646. The data of the first **database** and/or the second **database** may be aggregated into one or more groupings in

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accordance with the virtual schema...on an n-dimensional presentation 649.

Fig. 7 illustrates a conceptual diagram of a representative **database** in a 5 specific embodiment of the present invention. The **database** IO 1 in Fig. 7 includes a data object 702. Data object 702 includes an...

...is merely illustrative of the many different ways to represent information having spatial components in **databases** and data structures for use with a computer system.

Fig. 8 illustrates a ...A screen 802 in Fig. 8 comprises a plurality of fields for receiving information about **data base** tables, spatial and other information components and the like. For example, columns such as community...

...course, Fig. 8 is merely illustrative of the many ways to represent information in a **database** or data structure to a user.

Figs. 9A-9B illustrate representative example map presentation in... locations. More modern approaches permit police to produce more versatile electronic maps by combining their **databases** of reported crime locations with digitized maps of the areas they

#### Claim

I A method, comprising:  
receiving a first schema **database** ;  
forming a virtual schema including at least a portion of a dataset included  
within the first **database** ;  
receiving a first input indicating a criteria;  
aggregating data of the **database** into one or more groupings in accordance  
with the virtual schema and the first input...object meta data  
comprises:  
receiving a third input indicating a criteria;  
aggregating data of the **database** into one or more new groupings in accordance with the redefined virtual schema and the...  
...the n-dimensional presentation;

reflecting the relationship in the virtual schema; said virtual schema aggregating data of the database into one or more new groupings in accordance with the virtual schema; ...an n-dimensional presentation.

17 The method of claim 1, further comprising:

receiving a second **database** ;

15 forming a virtual schema including at least a portion of a dataset included

within at least one of the first **database** and the second **database** ;

receiving a first input indicating a criteria;

aggregating data of at least one of the first **database** and the second **database** into one or more groupings in accordance with the virtual schema and the first

input...1, further comprising:

providing customer centric information to a core of customer data within the **database** in accordance with the virtual schema.

20 A method, comprising:

receiving a first schema **database** ;

forming a virtual schema including at least a portion of a dataset included

within the first **database** ;

receiving a first input indicating a criteria;

receiving a second input indicating one or more regions;

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aggregating data of the **database** into one or more groupings in accordance with the virtual schema, the first input indicating...

...of data input from a source, and generates mapping rules controlling data

movement into a **data warehouse** ;

a metadata repository operative to hold the virtual schemas and mapping rules;

a **data warehouse builder**;

a spatial-object data repository;

a region checker; and

an n-dimensional presentation;

wherein the **data warehouse** is defined by at least a portion of the data

input, the virtual schemas, the...

...the source comprises at least one of a plurality of on line transaction processing (OLTP) **databases** .

23 An apparatus, comprising:

means for generating one or more virtual schemas including at least...

...data input from a source;

means for generating mapping rules controlling data movement into a **data**

**warehouse** ;

means for holding the virtual schemas and mapping rules;

means for generating one or more...

...for generating customer data analysis function code;

35

code for scheduling tasks for managing a **data warehouse** ;

code for pre-processing data for movement into the **data warehouse** ;

code for managing creation of the **data warehouse** ;

code for defining customer data analysis functions;

code for performing data source analysis;  
code for translating entities from a meta model into a data schema to  
form  
1 5 a database ;  
code for providing customer activity correlation queries with access to a  
database of a data warehouse ;  
code for providing customer data analysis functions;  
code for providing analysis results to at least...the customer activity  
components;  
wherein the focal group and the customized group comprise a reverse star  
schema meta model.

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5/3,K/3 (Item 3 from file: 349)  
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00948082 \*\*Image available\*\*  
**METHOD AND SYSTEM FOR DECISION SUPPORT ANALYSIS**  
**PROCEDE ET SYSTEME D'ANALYSE D'AIDE A LA DECISION**  
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EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR  
LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL  
TJ TM TR TT TZ UA UG UZ VN YU ZA ZW  
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Detailed Description

Claims

English Abstract

...also includes mapping at least one relationship among the first  
plurality of information in the database based upon the first physical  
model (1104). Dynamic attributes and profiles can be derived (1105...).

**Detailed Description**

... improvement exist. For example, according to conventional technologies, modeling of data is done using rudimentary **database** relationship diagrams. While these diagrams explain the information in a manner understandable to **database** system programmers and other such persons having a technical background, these methods are not convenient...business or other non-technical fields understand and manipulate relationships between various data entities in **databases**, for example.

Various applications are supported by specific embodiments. Multidimensional models, statistical computations, rule based...comprises a computer; an information store, operable to contain the data; a metadata repository, a **database** interface software process that maintains the data in the information store; a query/ ...a user interface software process that controls input to and output from the metadata. repository, **database** interface software process, the query/command generator software process, and the scheduler.

In a further...are related by a first subject model. In a specific embodiment, the computer memory has **data stored** thereon, which further comprises a second central concept entity; a second static attribute

3

entity...or

more commands based upon the metadata information. Then the commands are sent to a **database**, and the information received from the **database** responsive to the one or more commands is provided to one or more ... also part of the product. Further, code sends the one or more commands to a **database**; and code that provides information received I 0 from the **database** responsive to the one or more commands to one or more applications; are also part...upon the metadata information. The processor also sends the one or more commands to a **database** and provides information received from the **database** responsive to the one or more commands to one or more applications. The processor also...reports from a result of one or more applications acting upon information received from a **database** responsive to one or more commands created based upon a inetadata information retrieved from a...

...with business or other nontechnical fields understand and manipulate relationships between various data entities in **databases**, for example. Various applications are supported ...business or other non-technical fields understand and manipulate relationships between various data entities in **databases**, for example.

Fig. I illustrates a representative software architecture capable of supporting a decision support...

...present invention. As shown by Fig. 1, an architecture diagram I 00 comprises of a **database** 1 0 1 that contains information about a business process in a specific embodiment. The **database** 1 0 1 contains a plurality of data elements. The data contained within **database** 10 1 may be organized in a variety of different ways, which may be called schema. In a specific embodiment, **database** 101 is a relational **database**. Relationships between various data elements within **database** 10 1 are conceptualized by a physical model 102. Physical models, also known as relational...

...such as a customer, a transaction, a product, and so forth, stored in the relational database 101. ...or more subject models, such as  
8  
subject model 103. Subject model 103 comprises a reverse star schema (RSS) relationship among a plurality of data elements stored in the database 101.

Subject model 103 provides a way for users and consumers of the data in database 101 to think about the relationships among the data in a useful way...business analyses. Logical models provide a way for users and consumers of the data in database 101 to view relationships between different data elements in the database 101 in a hierarchical way. Representative examples of logical models will be described ... multiple subject system, which is an environment in which different applications run using the data stored in the database 101. Accordingly, more than one subject model 103 and more than one subject view 104...301 comprises a plurality of relationships between a plurality of groups and information entities in database 101, as illustrated by logical model 201. Logical model 201 provides a customer...a specific embodiment, the entities comprising the derived subject model 301 have a reverse star schema arrangement, with the customer entity 302 1 5 comprising a core component 320, as...between entities of customer, transaction, and product that are incorporated in information stored in the database

1 1

01. In a specific embodiment, the database is a relational database , however, other methods of storing and retrieving information may be used in various other specific...601 comprises a plurality of relationships between a plurality of groups and information entities in database 101, and illustrated by logical model 501, which provides a product centric view. The...In a specific embodiment, the entities comprising the derived subject model 601 have a reverse star schema arrangement, with the product entity 607 comprising a core component 620, as indicated by a... between entities of customer, transaction, and product that are incorporated in information stored in the database 101 in Fig. 1. In a specific embodiment, the database is a relational database , however, other methods of storing and ...a specific embodiment has 3-dimensions, is used to depict relationships among data in the database 101. Display 801 has dimensions of a customer average spending level, which comprises four...

...the zdirection. A total purchase information is a fact represented by graphing data in the database 101 according to the dimensions x, y, and z that have been selected.

Accordingly...a system 901 for managing and analyzing information comprises a computer system 902, coupled to database 101, a metadata, repository 910, and an optional input/output device(s located with database 101.

I 0 In some specific embodiments, one or both of metadata repository 910 and database 101 may be located on the computer system 902, while in alternative embodiments, one or both of metadata repository 910 and database 101 may be located on another computer system (not shown), which may be a server... .

. . .network may connect 1 5 computer system 902 with a server computer having access to database 101 and/or metadata repository 910, so that a client-server ...processes resident on computer system 902

provide various functions to the user. For example, a database interface software '20 process 905 maintains the information in the database 101. A query/command generator software process 906 provides access to the information in the database I 0 1. A scheduler software process 904 coordinates the events and actions in the...specific embodiment of the present invention. As shown in Fig. 10, in a specific embodiment, **database**

1 7

holds business data. ...of the physical schema (not shown) of the relationships in the information contained in the database 101. A plurality of subject views are provided by logical models 104, such as logical cube shape, enable business decision makers to analyze the information of database 1 0 1 as conceptualized by the logical models 104. Data mining is another application various views and models based upon the information in the database 1 0 1. Computer system 902 may also manage the information in the database 1 0 1, and perform searches of the database 101 in a specific embodiment. In some specific embodiments, computer system 902 is connected to creating models of information in a database and reducing the models to metadata, for example. Specific embodiments such as the representative specific...also includes mapping at least one relationship among the first plurality of information in the database based upon the first physical model (1 104). Optionally, a check can be performed in...also includes mapping at least one relationship among the first plurality of information in the database based upon the first physical model (I 104). Then, dynamic attributes and profiles can be...also includes mapping at least one relationship among the first plurality of information in the database based upon the first physical model (I 104). Then, dynamic attributes and profiles can be...to process data based upon the metadata (1 122). These commands are sent to the database 101 (I 123). Information retrieved from the database 1 0 1 responsive to the commands is passed to applications for further processing (I...well as, extend types of access, or views, to the information available to a financial **data mart** 121 0 and a marketing **data mart** 1212. For example, the marketing **data mart** 1212 may initially contain customer response information for a marketing campaign based upon product category...

#### Claim

... for managing data, comprising:  
a computer;  
an information store, operable to contain said data;  
a **database** interface software process that maintains said data in said information ...user interface software process that controls input to and output  
from said metadata repository, said **database** interface software process, said query/command generator software process, and said scheduler.

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. A computer...said  
metadata information;  
sending said at least one of a plurality of commands to a **database** ;  
providing information received from said **database** responsive to said at least one of a plurality of commands to at least one...metadata information;  
code sends said at least one of a plurality of commands to a **database** ;  
code that provides information received from said **database** responsive to said at least one of a plurality of commands to at least one...said metadata information; send said at least one of a plurality of commands to a **database** ; provide information received from said

responsive to said at least one of a plurality of commands to at least one...of at least one of a plurality of applications acting upon information received from a database responsive to at least one of a plurality of commands created based upon a metadata...

5/3,K/4 (Item 4 from file: 349)

DIALOG(R) File 349:PCT FULLTEXT

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00893388 \*\*Image available\*\*

**METHOD AND SYSTEM FOR MANAGING EVENT ATTRIBUTES**

**PROCEDE ET SYSTEME DE GESTION D'ATTRIBUTS D'EVENEMENTS**

**Patent Applicant/Assignee:**

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**Inventor(s):**

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**Legal Representative:**

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**Patent and Priority Information (Country, Number, Date):**

Patent: WO 200227528 A1 20020404 (WO 0227528)

Application: WO 2001US29801 20010924 (PCT/WO US0129801)

Priority Application: US 2000235390 20000925; US 2000235373 20000925; US  
2001309214 20010731; US 2001309633 20010801; US 2001963062 20010924; US  
2001963145 20010924

**Designated States:**

(Protection type is "patent" unless otherwise stated - for applications  
prior to 2004)

AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ  
EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR  
LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL  
TJ TM TR TT TZ UA UG UZ VN YU ZA ZW

(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR

(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG

(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Publication Language: English

Filing Language: English

Fulltext Word Count: 16315

**Fulltext Availability:**

Detailed Description

Claims

**English Abstract**

...techniques for managing and analyzing business information (100)  
comprising a computer system (102), coupled to database (101), a  
metadata repository (110). Specific embodiments provide persons with  
business or other non-technical...

...enhanced understanding of information, and greater capabilities to  
manipulate relationships between various data entities in databases ,  
for example.

**Detailed Description**

... improvement exist. For example, according to conventional  
technologies, modeling of data is done using rudimentary database  
relationship diagrams. While these diagrams explain the information in a

...manner understandable to database system programmers and others such persons having a technical background, these methods are not convenient...

...business or other non-technical fields understand and manipulate relationships between various data entities in databases , which represent events and information about events. Event based information can provide the business decision...

...or more events form a graph. The method further includes creating a query to a database based upon the graph.

In a specific embodiment, the method further comprises receiving an input indicating a filter expression for information in said database and storing said filter expression in said at least one node for each of said...

...further comprises receiving an input indicating an event duration expression for information in said database and storing said event duration expression in said at least one edge for each of...

...a graph. The computer program product also includes code that creates a query to a database based upon the graph and a computer readable storage medium for holding the codes.

1...

...of events form a graph. The processor is operative to create a query to a database based upon the graph.

In a representative embodiment, a method for managing system comprises, for example, a computer; an information store, operable to contain the data; a database interface software process that maintains the data in the information store; a metadata repository; and...

...or other non-technical fields to understand and manipulate relationships between various data entities in databases , for example. Various applications are supported by specific embodiments. For example, multidimensional models, statistical computations...enhanced understanding of information, and greater capabilities to manipulate relationships between various data entities in databases , for example.

The following definitional list contains terms that will be used herein to describe...

...the reader and is not intended to limit the present invention to any particular embodiment.

**Reverse Star Schema :** A Reverse Star Schema is a subject focused data model in which a business subject comprises a focal point...

...event data related to the subject is organized in relation to the focal point. A Reverse Star Schema can comprise a federated star schema that can evolve and grow to include more embedded star schema

relationships among data in a database. Each cube can be unfolded to reveal component dimensions and fact tables. The fact tables...

...has an understanding of an enterprise's data. The data may be contained within a **data warehouse**, for example, or distributed throughout the enterprise. The designer can define **database schemas**, such as a **Reverse Star Schema**, for example, as well as attributes, profiles, cubes, 5 jobs, maintenance policies, and the like...

...The business user can define reports, cubes, profiles, segmentation codes based on a given **Reverse Star Schema** and the like, but may be isolated from defining/modifying the **Reverse Star Schema**. Business users can also generate target customer sets using a Window interface.

**End Users:** An...system I 00 for managing and analyzing information comprises a computer system 102, coupled to **database** 101, a metadata repository I 10, and an optional input/output device(s) 108, which...

...In specific embodiments, metadata repository I 10 may be combined with or co-located with **database** 101.

In some specific embodiments, one or both of metadata repository 1 1 0 and **database** 1 0 1 may be located on the computer system 102, while in alternative embodiments, one or both of metadata repository 1 1 0 and **database** IO 1 may be located on another computer system (not shown), which may be a...

...embodiments, a network may connect computer system 102 with a server computer having access to **database** 1 0 1 and/or 10 metadata repository 1 1 0, so that a client...

...and/or a combination of hardware and software in various specific embodiments. For example, a **database** interface logic 105 maintains the information in the **database** IO 1. A query/command generator logic 106 provides access to the information in the **database** 101. A scheduler logic 104 coordinates the events and actions in the computer system 102 ...comprise a CCDW Model 340, and a DBWrapper 342. These processes provide interface to the **database** IO 1 of Fig. 1.

Fig. 3B illustrates representative software architecture in another specific embodiment...

...a CCDWModAI 380, and a CIDBAccess module 3 82. These processes provide interface to the **database** IO 1 of Fig. 1.

Fig. 4A illustrates a representative application information architecture capable of...

...of the present invention. As shown by Fig. 4A, an architecture diagram 400 comprises of **database** 1 0 1 that contains information about a business process in a specific embodiment. The **database** IO 1 contains a plurality of data elements. The data contained within **database** 1 0 1 may be organized in a variety of different ways, which may be called schema. In a specific embodiment, **database** 101 is a relational **database**. A physical model 401 conceptualizes relationships between various data elements within

database 101. Physical models, such as, for example, relational models, provide one or more...

...such as a customer, a transaction, a product, and so forth, stored in the relational database 101. Representative examples of physical models will be described herein with reference to...

...or more subject models, such as subject model 301. Subject model 301 comprises a reverse star schema (RSS) relationship among a plurality of data elements stored in the database 101.

Subject model 301 provides a way for users and consumers of the data in database 101 to think about the relationships among the data in a useful way...

...analyses. Logical model 201 provides a way for users and consumers of the data in database 101 to view relationships between different data elements in the database 101 in a hierarchical way. Representative examples of logical models will be described...

...Fig. 4A can support a multiple subject system, in which different applications run using the data stored in the database 101. Accordingly, more than one subject model and more than one subject view...301 comprises a plurality of relationships between a plurality of groups and information entities in database 101, as illustrated by logical model 201. Logical model 201 provides a customer centric view...

...a specific embodiment, the entities comprising the derived subject model 301 have a reverse star schema arrangement, with the customer entity 432 comprising a core component 420, as indicated by a...

...between entities of customer, transaction, and product that are incorporated in information stored in the database 101 - In a specific embodiment, the database is a relational database, however, other methods of storing and retrieving information may be used in various...Analysis Processing (OLAP) technology, for example.

A business user can interface with information in the database via the Business User Interface. After the user logs in, a determination is made which...

...each cube report, including cube reports in a designer interface, are kept in the repository database .

Fig. 7A illustrates a representative business report definition screen in a specific embodiment of the...business user can generate new cubes, or modify existing cubes based upon information in the database via the Business User Cube Constructor Interface. A Designer or a Business User can create...

...security level for each report, including cubes in designer interface, are kept in the repository database .

24

In specific embodiments, the user can generate a new report by adding, and/or...to an icon 1203 in the action list panel 1204, the system will query the database 101 to retrieve a list of customers that satisfy the profile value set 1201...

list of customer with the personalized e-mail contents I 0 retrieved from the customer database 1 0 1.

EVENT ATTRIBUTES

For example, consider a representative example situation in which.

a...model 1700 comprises a plurality of nodes and connections. Nodes represent information in tables of database IO 1. Connections represent relationships between the nodes. An event node 1702 comprises a description...

Claim

... of

said plurality of events form a graph; and thereupon creating a query to a database based upon said graph.

1 5

2 The method of claim 1, further comprising:  
receiving an input indicating a filter expression for information in said database ; and  
storing said filter expression in said at least one node for each of said...

...1, further comprising:

receiving an input indicating an event duration expression for information in said database ; and

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storing said event duration expression in said at least one edge for each...

...for managing data, comprising:

a computer;

an information store, operable to contain said data;

a database interface software process that maintains said data in said information store;

a metadata repository; and...

...form a graph; and thereupon said processor is operative to create a query to a database based upon said graph.

14 The apparatus of claim 13, wherein:

said processor is further operative to receive an input indicating a filter expression for information in said database ; and store said filter expression in said at least one node for each of said...

...further operative to receive an input indicating an event duration expression for information in said database and store said event duration expression in said at least one edge for each of...  
data, comprising:

a computer;

an information store, operable to contain said data;

I 0 a database interface software process that maintains said data in said information store;

metadata repository; and

web...

*not*  
5/3,K/5 (Item 5 from file: 349)  
DIALOG(R) File 349:PCT FULLTEXT

00749381

**62 HUMAN SECRETED PROTEINS**  
**SOIXANTE-DEUX PROTEINES HUMAINES SECRETEES**

## Patent Applicant/Assignee:

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## Patent and Priority Information (Country, Number, Date):

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Application: WO 2000US8979 20000406 (PCT/WO US0008979)

Priority Application: US 99128693 19990409; US 99130991 19990426

## Designated States:

(Protection type is "patent" unless otherwise stated - for applications  
prior to 2004)

AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB  
GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA  
MD MG MK MN MW NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA  
UG US UZ VN YU ZA ZW

(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE

(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG

(AP) GH GM KE LS MW SD SL SZ TZ UG ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Publication Language: English

Filing Language: English

Fulltext Word Count: 200486

## Fulltext Availability:

Detailed Description

Claims

**Detailed Description**

... translated. These regions are often referred to as "low complexity" regions.

Such regions can cause database similarity search programs such as BLAST to find high-scoring sequence matches that do not...tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases . Some of these sequences are related to SEQ ID NO: 1 I and may have...tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases . Some of these sequences are related to SEQ ID NO: 12 and may have been...

...healing.

Many polynucleotide sequences, such as EST sequences, are publicly Hable and accessible through sequence databases . Some of these sequences are

aval

related to SEQ ID NO: 13 and may have...tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases . Some of these sequences are related to SEQ ID NO: 14 and may have been...tissues.

Many polynucleotide sequences, Such as EST sequences, are publicly Hable and accessible through sequence databases . Some of these sequences are

aval

related to SEQ ID NO: 15 and may have...

...disorders.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases . Some of these sequences are related to SEQ ID NO: 16 and may have been...disorders.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases . Some of these sequences are related to SEQ ID NO: 17 and may have been...

...tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases . Some of these sequences are related to SEQ ID NO: 18 and may have been...ailments.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases . Some of these sequences are related to SEQ ID NO: 19 and may have been...Many

polynucleotide sequences, such as EST sequence s, are publicly available and accessible through sequence databases . Some of these sequences are related to SEQ ID NO:20 and may have been...

...tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases . Some of these sequences are related to SEQ ID NO:21 and may have been...tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are  
aval  
related to SEQ ID NO:71 and may have...tissues.

Many polynucleotide sequences, such as EST sequences, are publicly available and accessible through sequence databases. Some of these sequences are  
aval.  
related to SEQ ID NO:72 and may have...sequence, which are not matched/aligned, as a percent of the total bases of the query sequence. Whether a nucleotide is matched/aligned is determined by results of the FASTDB sequence...

#### Claim

... documentation to the extent that such documents are included in the fields searched

NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WEST, CAS ONLINE, MEDLINE

C. DOCUMENTS CONSIDERED TO BE...

5/3,K/6 (Item 6 from file: 349)

DIALOG(R) File 349:PCT FULLTEXT

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00743943 \*\*Image available\*\*  
**METHOD FOR DYNAMIC CUSTOMER PROFILING IN DATABASE**  
**PROCEDE PERMETTANT D'ETABLIR LE PROFIL DYNAMIQUE D'UN CLIENT DANS UNE BASE DE DONNEES**

Patent Applicant/Assignee:

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Legal Representative:

YEE George B F, Townsend and Townsend and Crew LLP, Two Embarcadero Center, 8th floor, San Francisco, CA 94111-3834, US

Patent and Priority Information (Country, Number, Date):

Patent: WO 200057312 A1 20000928 (WO 0057312)  
Application: WO 2000US7814 20000322 (PCT/WO US0007814)  
Priority Application: US 99125721 19990323; US 2000532366 20000321

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AE AG AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TT TZ UA UG UZ VN YU ZA ZW

(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE

(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG

(AP) GH GM KE LS MW SD SL SZ TZ UG ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Publication Language: English

Filing Language: English

Fulltext Word Count: 6953

**METHOD FOR DYNAMIC CUSTOMER PROFILING IN DATABASE****Fulltext Availability:****Detailed Description**  
**Claims****English Abstract**

According to the present invention creating and accessing customer information (402) in a **database**, **data mart** or **data warehouse**, segmenting customer information into one or more groups of customers (404), having one or more...

**Detailed Description****METHOD FOR DYNAMIC CUSTOMER PROFILING IN DATABASE****CROSS-REFERENCES TO RELATED APPLICATIONS**

This application claims priority from the following U.S. Provisional...

...filed March 23, 1999.

**BACKGROUND OF THE INVENTION**

The present invention relates generally to computer **database** systems, and specifically to methods for visualizing information from a **data warehousing** environment.

Few could foresee the rapid development of computer technology just a few years ago...

...an ever increasing portion of our daily lives, governments, businesses and individuals have turned to **database** technology to help them manage the "information explosion," the exponential proliferation of information that must be sorted, assimilated and managed on a continuing basis. One area of importance to the **database** design field is data model selection for **database** applications.

A data model represents the structure or organization of **data stored** in the **database**. It enables the use of data in certain forms and may limit the data being...

...Many different data models can exist, and they usually differ markedly from one another. Typically, **database** applications are customized to a particular data model of a particular **database**.

Usually, these applications must be re-implemented for every **database**, even though the functioning of the application remains the same.

Presently, **database** developers have turned to **data warehousing** technology to resolve often conflicting data management requirements. Traditional **data warehousing** approaches focus on decision support applications, which emphasize summarized information. While perceived advantages exist, an...

...analyses techniques can be improved over traditional approaches by methods for displaying analysis results and **database** content to the user.

What is needed is a method for analyzing customer data contained in **databases**, **data marts** and **data warehouses**.

**SUMMARY OF THE INVENTION**

According to the invention, techniques for profiling of human behavior based upon analyzing data contained in **databases**, **data marts**

and **data warehouses** have provided. In an exemplary embodiment, the invention provides a method for creating a dynamic...  
from a variety of sources in order to provide visual representations of data in a **data warehousing** environment.

A first aspect in accordance with the present invention provides a method for creating a customer profile from customer information. The customer information can be stored in a **database**, multiple **databases**, a **data mart** or a **data warehouse**, for example.

The customer information can comprise one or more attributes. Attributes can include age...

Receiving can be by means of direct input, or by accessing data in a legacy **database**, for example. Segmenting the customer information into one or more groups, or segments, based upon...according to the present invention provide frameworks for users to create and manage customer centric **data warehouses** having a wide variety of data models such as a **star schema** data model, a **reverse star schema** data model and the like.

Such **data warehouses** can avail themselves of analytical functions such as Market Basket Analysis (MBA), Regency/Frequency/Monetary...

user interfaces (GUI) that enable users to define segmentation schemes for customers and then generate **database** data based upon the segmentation. This **database** data can then be incorporated into the **data warehouse** for use in additional analysis by the user. Some specific embodiments can also include tools...

such as OLAP tools, for example. In this representative example, the bank can produce a **data warehouse** having profiling information that is suitable for viewing using popular visualization tools such as OLAP...

provided by the segmentation assignment into a one or more profiles. For example, a representative **database** can include an age attribute for each customer.

Table I illustrates a particular embodiment in...scope of the present invention.

A data model represents an organization of data in a **database**. Choice of a data model facilitates the use of data in certain ways and may...

applications typically require different data models that are usually quite different from one another. Thus, **database** applications are typically customized to the data model used by the **database**. These applications can be implemented for

8

**databases** having different data models even though the underlying logic of the application may be similar...

code; and 3) the usefulness of the application when using a particular specialized data model.

**Database** applications can be written to conform to a meta model and refer to the detailed combination that can be useful in **data warehouse** applications. In this combination, the star schema comprises a "universal data model" and the multidimensional model comprises a meta model.

EIC 3600

Dialog Search

B-C3 Customer Profiling  
Profiles:  
- :gg  
'g  
E3 Codei  
NYA...  
.3  
77@  
@ I MM  
.....  
Console Root  
21 CCDWSnapIn x@  
B demo  
IH: I Customer Centric Data Warehouse  
Mi-D Customer Intelligence Analysis  
j  
B Customer Profiling  
B-C3 Profiles  
M+-.C] Profit...

...to the extent that such documents are included in the fields searched  
IEEE, ACM  
Electronic data base consulted during the international search (name  
of data base and, where practicable, search terms used) Pleaw See  
Extra Sheet.

C. DOCUMENTS CONSIDERED TO BE...

...61 10-11t 16-19t 229 26-28@ 35-39@ 42-"

B. FIELDS SEARCHED

ElectroRic data bases consuked (Nium of data base and where  
practicable terms used): AkaVista, Google, WEST 2. O. Search Toms:  
databases , data warehouse , data man, data mining, customers or  
users, profile attribute, segmenting or segments, groups, partition or...

5/3,K/7 (Item 7 from file: 349)  
DIALOG(R) File 349:PCT FULLTEXT  
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00579159 \*\*Image available\*\*  
METHOD FOR PROVIDING A REVERSE STAR SCHEMA DATA MODEL  
PROCEDE PERMETTANT DE REALISER UN MODELE DE DONNEES POUR SCHEMA EN ETOILE  
INVERSEE

Patent Applicant/Assignee:

METAEDGE CORPORATION,  
CHEN Li-Wen,  
ORTIZ Juan J,

Inventor(s):

CHEN Li-Wen,  
ORTIZ Juan J,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200042532 A1 20000720 (WO 0042532)  
Application: WO 2000US906 20000113 (PCT/WO US0000906)  
Priority Application: US 99116086 19990115; US 99306677 19990506; US  
99306650 19990506; US 99306693 19990506

Designated States:

(Protection type is "patent" unless otherwise stated - for applications  
prior to 2004)

AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB

GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LG LK LR LS LT LU LV MA  
MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA  
UG US US US US UZ VN YU ZA ZW GH GM KE LS MW SD SL SZ TZ UG ZW AM AZ BY  
KG KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE  
BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG

Publication Language: English

Fulltext Word Count: 11569

**METHOD FOR PROVIDING A REVERSE STAR SCHEMA DATA MODEL**

Fulltext Availability:

Detailed Description

Claims

English Abstract

According to the invention, techniques for organizing information from systems in a **data warehousing** environment are provided. In an exemplary embodiment, the invention provides a method for analyzing data

...

...to the invention can translate data from a variety of sources (203, 204) to particular **database** schema in order to provide organization (200-204) to a **data warehousing** environment.

Detailed Description

METHOD FOR PROVIDING A REVERSE STAR SCHEMA DATA

MODEL

CROSS-REFERENCES TO RELATED APPLICATIONS

This application claims priority from the following U...

...Li-Wen Chen

entitled, "METHOD AND APPARATUS FOR PERFORMING CUSTOMER DATA ANALYSIS OF A COMPUTER DATABASE USING REVERSE STAR SCHEMA DATA MODEL," (Attorney Docket Number 19608-000 I OOUS) filed January 15, 1999.

The following...

...Application Serial No. Li-Wen Chen and Juan Ortiz entitled, "METHOD FOR PROVIDING A REVERSE STAR SCHEMA DATA MODEL," (Attorney Docket Number 19608-0001 I OUS);  
2. U.S. Patent Application Serial No. Li-Wen Chen entitled, "APPARATUS FOR PROVIDING A REVERSE STAR SCHEMA DATA MODEL," (Attorney Docket Number 19608-00012OUS); and  
3. U.S. Patent Application Serial No. Li-Wen Chen entitled, "SYSTEM FOR PROVIDING A REVERSE STAR SCHEMA DATA 25 MODEL," (Attorney Docket Number 19608-00013OUS).

BACKGROUND OF THE INVENTION

The present invention relates generally to computer **database** systems, and specifically to methods for organizing information from one or more systems in a...

...an ever increasing portion of our daily lives, governments, businesses and individuals have turned to **database** technology to help them manage the "information explosion," the exponential proliferation of information that must be sorted, assimilated and managed on a continuing basis. One area of importance to the **database** design field is data model selection for **database** applications.

A data model represents the structure or organization of **data stored** in the **database**. It enables the use of data in certain forms and may

...Many different data models can exist, and they usually differ markedly from one another. Typically, **database** applications are customized to a particular data model of a particular **database**.

Different **database** vendors base their products on different data models, adding to the confusion. Usually, these applications must be re-implemented for different **databases**, even though the functioning of the application remains the same.

Presently, **database** developers have turned to **data warehousing** technology to resolve often conflicting data management requirements. Traditional **data warehousing** approaches focus on decision support applications, which emphasize summarized information. While perceived advantages exist, an...

...usually loses the detail level of information about customer identity, limiting the usefulness of traditional **data warehousing** approaches in these types of applications.

What is needed is a method for providing a **database** that can be customized to fit individual user needs, yet also able to support data...

...invention, techniques for organizing information from a variety of sources, including legacy systems, in a **data warehousing** environment are provided. In an exemplary embodiment, the invention provides a method for analyzing data...

...Embodiments according to the invention can translate data from a variety of sources to particular **database** schema in order to provide organization to a **data warehousing** environment.

The method includes a variety of steps, such as providing a model for an ...

...data organization can include data schema and the like. Data schema define aspects of the **database**, such as attributes, domains and parameters, and the like, to a **database** management system ( **DBMS** ). The 1 5 method also includes creating one or more **databases** for containing the data. Translating data from one or more sources to the data organization is also part of the method. A step of incorporating data into the **database** is part of the method. The method can also include a step of performing analysis on the data in the **database**. Accordingly, the combination of these steps can provide an environment for analyzing information about customers, business processes and the like.

In another aspect of the present invention, techniques for **data warehousing** are provided. In a particular embodiment, the invention provides a method for creating a **database** for organizing information from one or more sources. Embodiments can organize the data in the **database** according to a data schema, such as a reverse **star schema**. A **reverse star schema** model comprises an identity element (e.g., core components, and the like) and one or...in source tables and primary and foreign keys. A step of creating one or more **databases** from the schema is also part of the method. The **database** can be a customer **data warehouse**, and the like. Creating data movement mapping rules can also be part of the method...

...provide information about translation of information in tables and attributes of data sources to the **data warehouse**.

In an embodiment according to the present invention, the method also includes providing users the...

...automatically derived data types if they so choose. Embodiments can also provide analysis functions of **database** contents, such as market basket analysis for customer buying behavior, customer valuation analysis, customer segmentation...

...The present invention provides techniques, including a method for organizing information from one or more **databases**, including legacy **databases**, in a **data warehousing** environment. Methods according to the invention can provide for more efficient use and storage of...

...nation. In an exemplary embodiment, the invention provides a method for providing a customer centric **data warehouse** for business information. While the invention will be discussed generally in terms of such customer...

...limiting.

Fig I illustrates a simplified block diagram of representative customer data analysis architecture for **data warehousing** in a particular embodiment according to the present invention. This diagram is merely an illustration...

...a plurality of components in a particular embodiment according to the present invention, including a **data warehouse** 100, that can comprise customer centric information, for example, a schema generation component, denoted 104, that reference data, as denoted by arrows 1 1 1 stored in **data warehouse** 100. A plurality of data sources 101, from which data can be moved into **data warehouse** 100, as indicated by arrow 1 12 are also illustrated in Fig. 1. **Data warehouse** 100 provides data accessibility to a plurality of functions and applications, such as meta ...

...and generated customer data analysis functions 104. Many of these components are defined by a **data warehouse** builder 109.

A presently preferable embodiment includes a **data warehouse** builder 109 central to the environment. **Data warehouse** builder 109 is operative to perform a wide variety of tasks including building and managing a **data warehousing** environment. These building and managing tasks can comprise tasks such as integrating meta data information...

...example, a data schema 107, data processing and data movement rules 106, and the like. **Data warehouse** builder 109 can also perform the tasks of generating a data schema, such as data schema 107, for a customer-centric **data warehouse**, such as **data warehouse** 109, and providing a data repository for meta data, such as data repository 105.

Meta-data defined and organized by **data warehouse** builder 109 can include a data schema, such as a **star schema**, a **reverse star schema**, as well as many other data schema topologies, a plurality of source data processing, movement and loading rules, job schedules for loading or maintaining data flow within the **data warehouse**, user provided parameters for code generation of customer data analysis functions, and the like.

Further, **data warehouse** builder can generate customer data analysis

function code 102, 104, manages the operation of the building and maintenance of data warehouse 100, manage the data flow across the systems I 10- 1 12 and manage the constructing and maintaining of the data warehouse 100.

A presently preferable embodiment according to the present invention provides data warehouse 100 defined by data warehouse builder 109. Data warehouse 100 provides support for customer-centric data analysis and customer-centric decision making. Data warehouse 100 can accept data from a plurality of sources, as represented by arrow 112 of Fig. 1, such as data sources 101. Data sources can include existing legacy database systems, existing business applications, legacy accounting, management information systems and the like. This data warehouse is defined according to data schema 107 generated by the data warehouse builder 109.

Data sources 101 represents one or more legacy systems having original customer...

...any of a wide variety of different formats, such as flat files, ASCII files, relational database tables and the like. Embodiments according to the present invention provide the capability to pre-process the data before incorporating it into the data warehouse. Additionally, the present invention provides techniques for incorporating data 112 into the customer-centric data warehouse 100. Data 112 can be consolidated, transformed and formatted based on one or more of a plurality of mapping rules 106 by data warehouse builder 109 before being moved into the data warehouse and populated into the data base.

Customer data analysis functions 102, 104 can access data populated in the customer-centric data warehouse to analyze customer behaviors, business activity correlation patterns, and the like. Customer data analysis functions...

...functions 102 and dynamically generated customer data analysis functions 104. These analysis functions can analyze database contents providing insight into the operations of the enterprise.  
In a particular embodiment according to...

...be provided as built in functions. Such functions can access meta data, such as meta data stored in meta data repository 105 of data warehouse builder 109. In a presently preferable embodiment, meta data repository 105 can include information about...

...Such meta data enables accessing applications to understand and retrieve data located in customer centric data warehouse 100.

In a particular embodiment according to the present invention, a data warehouse builder, such as data warehouse builder 109 generates code for one or more of a plurality of dynamically generated customer...

...of Fig. 1. Meta data information can be embedded in the generated code by the data warehouse builder 109.

Customer data analysis applications 103 comprise front-end business applications adapted to use...In a presently preferable embodiment according to the present invention, a 15 novel reverse star schema data model provides customer data analysis capabilities not provided by techniques heretofore known in the...

...scope of the present invention.

A data model represents an organization of data in a **database**. Choice of a data model facilitates the use of data in certain ways and may...

...can be quite incompatible with other data models. Often, these applications are re-implemented for **databases** having different data models even though the underlying logic of the application may be similar  
...

...applications can customize a data model by following the relationships described in the meta model.

**Database** applications can be written to conform to a meta model and refer to the detailed...

...of the multi-dimensional model.

Fig. 3B illustrates a representative meta model for a reverse **star schema** in a particular embodiment for performing customer data analysis according to the present invention. This...plurality of useful possible ways of viewing customer data analysis results.

Embodiments employing a reverse **star schema** provide a detail level view for data that provides the capability to perform analysis based...

...and alternatives.

The data model of Fig. 4A is a data model having a reverse **star schema** organization.

Fig. 4A illustrates a representative data model comprising a focal group 2 1 0...

...simplified entity relationship diagram of a representative example of a data model having a reverse **star schema** organization in a 1 0 particular embodiment according to the present invention. This diagram is...converted to a physical schema 403 that can be used to create a customer-centric **data warehouse**, such as customer centric **data warehouse** 1 00. In a particular embodiment 1 5 according to the present invention, a user customizes features of his or her **data warehouse** based on characteristics of his or her particular application and the availability of source data...

...which can include events or other transaction types, can be used to make a customercentric **data warehouse** by data type definitions 411, 413, determination of primary keys and foreign keys 41 1...

...used to map data sources, such as data sources 10 1 to a customer-centric **data warehouse**, such as customer centric **data warehouse** 1 00. Mapping rules 404 comprise meta data that describes how the data in external sources can be mapped to the data table and attributes in the **data warehouse**.

Mapping rules 404 can further comprise a plurality of transformation rules in some embodiments.

Fig...

...representative flow diagram of a simplified process for generating a data model having a reverse **star schema** organization in a particular

...In many embodiments, these event transaction types can be used as domain constraints when the **data warehouse** is created. Some embodiments provide event transaction types as attribute values for customer event correlation...attributes to comprise the source of the data tables and attributes of the customer-centric **data warehouse**.

5 In a step 413, a plurality of data types is determined based on source ...

...0 1 of Fig. 1. Data types of tables and attributes in the customer centric **data warehouse** can be derived based on data types in the source tables. Many embodiments provide the...

...known to persons of ordinary skill in the art, such as for example, using a **database** design tool called ERWin/ERX by Platinum Technologies, Inc., a company headquartered in Oakbrook Terrace...

...departing from the scope of the present invention.

In a step 414, a customer-centric **data warehouse** database is created from the schema created in step 411. The **data warehouse** builder 100 can construct the customer-centric **data warehouse** based upon the schema 403 and **database** configuration information provided by a user. The **data warehouse** builder employs **database** commands and programming interfaces to accomplish building the **data warehouse**. In a step 415, a plurality of data movement mapping rules is created.

Mapping rules...

...and attributes of data sources, such as data sources IO 1, to a customer-centric **data warehouse**, such as the customer centric **data warehouse** created in step 414. This can be accomplished using any number of techniques known to persons of ordinary skill in the art, such as for example, using a **database** design tool called EXTRACT by Evolutionary Technologies International, a company with headquarters in Austin, Texas ...

...of the present invention.

Figs. 6A-6F illustrate simplified user interface screens in a representative **data warehousing** method in a particular embodiment according to the present invention.

These diagrams are merely illustrations...

...invention. A first level includes a "project" folder 502 having components for creating a **data warehouse** for a particular enterprise. Under the project level is a component level having a plurality of components belonging to the parent project folder. A first component 504 of "reverse star schema" is highlighted. The highlighting indicates that this component is the next component to be defined...

...particular embodiment according to the present invention. Dialog box 503 is displayed whenever the "reverse star schema" component 504 is selected from project starting screen 501.

Dialog box 503 enables the user...

...Entering the appropriate information and clicking the "OK" button causes the embodiment to present a **database** creation screen.

Fig. 6C illustrates the contents of a general tab of **database** creation screen 505. Screen 505 includes a **database** name field 530, a **database** files area 532 and a file properties area 534. The user enters information appropriate for...

...6D.

Screen 507 includes fields to enter information about the kind and size of a **database** transaction log, including a files area 542 and a file properties area 544. The user...

...and clicks the "OK" button. The user can then I 0 move to the reverse **star schema** customization screen.

Fig. 6E illustrates a reverse **star schema** customization screen 509 in a particular embodiment according to the present invention. Customization screen 509...according to the invention. The embodiment of Figs. 6A-6F can provide for a reverse **star schema** data model. However, other data models and organizations of data can be used without departing...

...capability to translate entities from a meta model to a data schema to form a **database**. In many embodiments, an SQL query can then be generated to query the resulting **database**.

A customer activity correlation analysis layer 603 provides the foundation of customer data analysis in layer 602. Layer 603 provides the capability for customer activity correlation queries to access the **database** of a customer-centric **data warehouse**.

Layer 603 references the meta model 607 in meta data repository 600 to determine the data schema of data in the customer-centric **data warehouse**.

Customer data analysis layer 602 provides customer data analysis functions. Layer 602 comprises components that...

...meta data repository 600, and accessed by this layer.

Fig. 7B illustrates representative customer centric **data warehouse** builder, such as the customer centric **data warehouse** builder 109 of Fig. 1, in a particular embodiment according to the present invention. This...

...of ordinary skill in the art would recognize other variations, modifications, and alternatives. Customer centric **data warehouse** builder of Fig. 7B comprises a data schema designer module 623 operable to integrate business model requirements and data source analysis and generate target data schema for the customer-centric **data warehouse**. The process of data schema generation has been discussed in reference to Fig. 5B. Module...

...repository 600 stores meta data, including meta data about data schema, such as the reverse **star schema** generated by schema designer module 623, data movement mapping rules, various job schedules to load or maintain data flow to and within the **data warehouse**, user parameters for code generation of customer data analysis, and the like.

**Code generation module**

...5 code. Function code is generated based on stored meta data, such as the meta data stored in meta data repository 600. Meta data, such as the finalized data schema, and user...

...management module 627 manages operations of the building, management, and maintenance of the customer-centric data warehousing environment. This can include management of jobs, events, exceptions, schedules and the like throughout the data warehouse environment. Planned tasks can be managed as jobs using schedules. Occurrences of activity can be...

...before data movement, physical data transport across networks, and data loading tasks on destination machines.

Data warehouse construction and management module 625 manages the construction of the data warehouse, including database object management tasks such as table creation, physical space management, indexing and the like. Further, module 625 manages data warehouse operations after the data warehouse has been constructed.

Customer data analysis function designer module 621 defines the configuration of customer...by Job/Event/Schedule Management Module 627 to perform tasks based on operational meta data.

Database applications comprise application code based on a data model used in a database. Typically, the application code is designed and developed after the data model is realized. Application...

...to application code enables the application to work with a particular customer's unique requirements. Database designers make choices from among competing factors for designing a particular data model and accompanying...

...star schema comprises the data model and the multi-dimensional model comprises the meta model. Data warehousing techniques can be embodied using many data model and meta model combinations. Meta models simplify ...

...called the schema, which can be a star schema, or others.

A schema is a database organization corresponding to a data model. Records in dimension tables of a relational database can be mapped to a plurality of indices of the dimensions in multi-dimensional model, and the records in a database fact table can be mapped to the measures or data points in the multi-dimensional...

...used in a plurality of corporate-wide decision support applications. Various applications, tools, systems, frameworks, database managers and the like can be embodied as re-usable products based on the meta...

...data model where an improved or optimized analysis is desired for use with customer centered data warehousing systems and applications. Thus, in some embodiments, the techniques of the present invention could provide access to many different legacy business, governmental and educational databases of all kinds. Of course, one of ordinary skill in the art would recognize other...

Claim

...of data sources off-said enterprise; forming a data organization for said model; creating a database having said data organization; translating data from said at least one of a plurality of...  
...data organization, to form a plurality of translated data; incorporating said translated data into said database ; and 1 0 performing analysis on said translated data in said database , wherein said 1 1 data organization comprises at least one of a plurality of data...  
...data tables to form a data schema, wherein said data schema 6 is a reverse star data schema ; 7 determining at least one of a plurality of attributes based on data types of...  
...determining for said attributes at least one of a plurality of primary keys; creating a data warehouse database from said data schema; creating at least one of a plurality of data mapping rules...  
...rules providing translation information for tables and attributes of said data sources to said data warehouse .  
25 The method of claim 24 further comprising defining for said attributes at least one...  
...method for integrating customer data analysis tools with at least one of a plurality of database systems, said method comprising: installing a data warehouse database , said database having a reverse star schema data model, said reverse star schema mapping to data in said at least one of a plurality of database systems; performing customer data analysis using said data warehouse database  
.  
31 The method of claim 30 wherein said customer data analysis comprises customer purchasing behavior...  
.522  
rl service based  
Cancel Help  
FIGm 6B  
SUBSTITUTE SHEET (RULE 26)  
530  
505  
Create database  
General Transaction Log  
Database Name  
Database files  
File n Initial size(MB)  
5 3 2 ame [Location file group  
.....  
File Properties...  
...RI (D Restricted legrowth(MB) F=  
F-O-W71 F@@j  
FIG, 6C  
-r507

EIC 3600

Dialog Search

Create a database FULLTEXT  
General I Transaction Log

Database Files

File name I Location Initial size(MB a rou  
542

..... LEI

File Properties

--oAutomatically...FIG, 7A  
SUBSTITUTE SHEET (RULE 26)

/ 16

Customer Data Customer-Centric Data Processing  
Analysis Business Data Warehouse and Movement  
Logic Code Construction, from source to  
Generation Management Data Warehouse  
Code 624 Data 625 Data 626  
Generation Warehouse Processing/  
Module Construction/ Movement/  
Management Loading  
Module...

...minimum documentation to the extent that such documents are included in  
the fields searched Electronic data base consulted during the  
international search (name of data base and, where practicable,  
search terms used)

WEST

search terms: data warehousing , meta data, enterprise, business,  
database

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category\* Citation of document, with indication, where appropriate, of...

5/3,K/8 (Item 8 from file: 349)

DIALOG(R) File 349:PCT FULLTEXT

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00579157 \*\*Image available\*\*

METHOD FOR VISUALIZING INFORMATION IN A DATA WAREHOUSING ENVIRONMENT  
PROCEDE DE VISUALISATION D'INFORMATIONS DANS UN ENVIRONNEMENT DE DEPOT DE  
DONNEES

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AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB  
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MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA  
UG US US US UZ VN YU ZA ZW GH GM KE LS MW SD SL SZ TZ UG ZW AM AZ BY  
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## METHOD FOR VISUALIZING INFORMATION IN A DATA WAREHOUSING ENVIRONMENT

Fulltext Availability:

Detailed Description

Claims

### English Abstract

According to the invention, techniques for visualizing customer data (103) contained in databases (6), data marts and data warehouses (8). In an exemplary embodiment, the invention provides a method for graphically analyzing relationships in...

...from a variety of sources in order to provide visual representations of data in a data warehousing environment (8). ...

### Detailed Description

METHOD FOR VISUALIZING INFORMATION IN A DATA  
WAREHOUSING ENVIRONMENT

CROSS-REFERENCES TO RELATED APPLICATIONS

This application claims priority from the following U.S...

...APPARATUS FOR PROCESSING CUSTOMER DATA

I O FOR OLAP INTEGRATION AND APPLICATION INTEGRATION BASED ON  
REVERSE STAR SCHEMA , " (Attorney Docket Number 19608-000200US) filed  
January 15, 1999.

The following commonly-owned co-pending...

...S. Patent Application Serial No. Li-Wen Chen  
entitled, "METHOD FOR VISUALIZING INFORMATION IN A DATA  
WAREHOUSING ENVIRONMENT," (Attorney Docket Number 19608-000210US);  
2. U.S. Patent Application Serial No. , Li-Wen Chen  
entitled, "APPARATUS FOR VISUALIZING INFORMATION IN A DATA  
WAREHOUSING ENVIRONMENT," (Attorney Docket Number 19608-000220US);  
and  
3. U.S. Patent Application Serial No. Li-Wen Chen  
entitled, "SYSTEM FOR VISUALIZING INFORMATION IN A DATA  
WAREHOUSING ENVIRONMENT," (Attorney Docket Number 19608-000230US).

### BACKGROUND OF THE INVENTION

The present invention relates generally to computer database systems, and specifically to methods for visualizing information having dynamic formats stored in a data warehousing environment.

Few could foresee the rapid development of computer technology just a few years ago...can also be part of the method. Thereupon, data can be migrated from the first database to the second database according to the mapping.

A third aspect in accordance with the present invention provides for a method of analyzing information from a database . The database can be organized according to a first data model. The method can include receiving as...

...in analyzing and understanding the performance and efficiency of operations. Decision support systems can include data warehouse , datamarts, and the like. Decision support systems are predominately based on multidimensional models, and can...front end" to OLAP tools that

accept users' command inputs. An OLAP server 2 generates a database queries 4 for databases 6 from users' command inputs. The users can enter command inputs using a graphical user...

...GUI) or command line interfaces and the like. The command inputs can be applied to database 6 in order to retrieve information that can be provided to the user for presentation...

...with multidimensional model 5, for example. The OLAP server can translate users' command inputs to database queries using a mapping of a users' multi-dimensional data model, as will be discussed...

...3 can comprise a mapping from the user's multidimensional data model 5 to a database model, such as data base 6. OLAP meta data 3 can provide a mapping of tables and attributes of multi-dimensional model 5 to dimensions and facts for database 6, for example.

6

OLAP generated queries 4 can be generated by OLAP server 2 to retrieve a result set from database 6, for example. Multi-dimensional models 5 comprise conceptual models that can provide a "macro..."

...console can display the data models to users in a I O GUI, for example.

Database 6 is created by the decision support manager 21. Users can define a schema for database 6 from an administration console 20. Ad-ministration console 20 can be co-located with...

...console 20.

After users define their models, the decision support manager 21 can automatically create databases , such as database 6, according to the users' data model definitions. The decision support manager 21 can generate...

...dimensional cube 5, for example. Manager 21 can generate procedures and mapping rules to populate databases with data from the data warehouse 8.

Meta data repository 22 can store meta data used by decision support manager 21...

...support manager 21 can comprise a management process for managing the intermediary table cache 7.

Data warehouse 8 comprises a data repository for customer data, business operational data, and the like. Data warehouse 8 can comprise a database , and can be

7

used as an operational data store , for example. In a presently preferred embodiment, data warehouse 8 can have an identity centric data organization with customer information comprising the center identity...

...6 4reverse star schema" data model. This data organization comprises a "back-end tier" of data warehouse 8, while the front end tier is based on a data model called a "star...

...transformed and moved before it is used. The data can be transformed into a reverse star schema data model, for example, when it is stored into the data warehouse 8.

Analysis reports. IO can be generated from the contents of **data warehouse**

8. Users can request reports from the administration console 20. Manager 21 can formulate a query to **database** 6 in order to retrieve data. Manager 21 can send the data to the user as a report.

Applications I I comprise business applications, and the like, that work with **data stored in data warehouse** 8. Applications I I can comprise sales force automation applications, marketing automation applications, E-commerce...

...customer-centric decision support functions based on tables 12 that can be generated from the **data warehouse** 8, for example.

OLAP meta data can be generated based on a defined data model...scope of the present invention.

A data model represents an organization of data in a **database**. Choice of a data model facilitates the use of data in certain ways and may...

...applications typically require different data models that are usually quite different from one another. Thus, **database** applications are typically customized to the data model used by the **database**. These applications can be implemented for **databases** having different data models even though the underlying logic of the application may be similar

...

...code; and 3) the usefulness of the application when using a particular specialized data model.

**Database** applications can be written to conform to a meta model and refer to the detailed...

...meta model combination is the star schema/multidimensional model combination that can be useful in **data warehouse** applications. In this combination, the star schema comprises a "universal data model" and the multidimensional model comprises a meta model.

**Data warehouses** can use multi-dimensional models, such as meta models, to conceptualize business operations, for example...

...are mapped to the indices of the dimensions in a multi-dimensional model of the **database**, and the records in the fact table can be mapped to the measures or data points in the multi-dimensional model of the **data base**.

I 0

11

xg T-uolsno v 2111AUTI suotluziuvi?.io 7alup p;Dsloq;Douuuuojiod luuoijujodo...detail below with reference to Figs. 3A-3D using an example of a business customer **data warehouse**.

Figs. 3A-3D illustrate simplified entity relationship diagrams for representative example information relationships, or "schema...may include other types of analyses. Information to be analyzed is retrieved from a customer **database**, which can be part of a **data warehouse**, such as **data warehouse** 8 of Fig. IA, for example, or a **data mart**. In many embodiments, this information will be directly or indirectly related to a specific customer...

...In a representative embodiment consolidating and structuring information can comprise extracting the information from source **databases**, transforming it into formats compatible with the underlying meta model, which can be a **reverse star schema**, for example, and then loading the data into the meta model.

In a step 504...simplified entity relationship diagram of a representative example of a data model having a **reverse star schema** organization in a particular embodiment according to the present invention. This diagram is merely an...data model where an improved or optimized analysis is desired for use with customer centered **data warehousing** systems and applications. Thus, in some embodiments, the techniques of the present invention could provide access to many different legacy business, governmental and educational **databases** of all kinds. Of course, one of ordinary skill in the art would recognize other...

**Claim**

... 1 . A method for creating a multi dimensional report from information in at least one **database** , said method comprising:  
receiving a definition of at least one customer profile of a plurality...

...11 A method for creating a multi dimensional report from information in at least one **database** , said method comprising:  
receiving a definition of at least one customer profile of a plurality...

...a user input indicating a report configuration selection;  
extracting information from said at least one **database** ;  
1 1 creating at least one first dimension table based upon said report configuration selection...

...said information comprises health care information.

20 A method of transferring information from a first **database** , said first **database** organized according to a first data model, to a second **database** , said second **database** organized according to a second data model to serve as the basis of analysis of...  
...said first data model to said second data model;  
migrating said data from said first **database** to said second **database** according to said mapping.

21 The method of claim 20 wherein said first data model...

...26

29 The method of claim 20 wherein said second data model comprises a **reverse star schema** .

30 A method of analyzing information from a **database** , said **database** organized according to a first data model, said method comprising:  
receiving as input a ...of claim 30 wherein said information comprises health care information.

27

/19

Multi- Generated  
dimensional Database  
PoIMA Model

Intermediary

Table Cache  
OLAP Data  
Server. nerat Source  
Data Warehouse C?  
'S 14  
OLAP  
Console  
0  
103 k  
k  
ports  
Tables Ge  
on Demand  
App...

...Foreign keys

Dimension Dimension  
Table 3 Table 4  
Primary Primary  
Key Key  
An Example of Star Schema  
Fig. 2A  
Dimension 2  
Dimension 3  
act  
Dimension I  
Multi-dimensional Model,  
Fig. 2B  
/19...

...hierarchies

Dimensions of Dynamic Customer  
Segmentation  
Customer  
ar  
2 30  
Service re e &  
Billing Return  
Reverse Star Schema  
Fig. 2C  
/19  
Legend  
Static hierarchies for Dynamically generated  
customer dimension hierarchies for  
..... customer dimension...

...tables in the

Intermediary Table

r2ch  
Customer  
Profiling  
Hierarchies Create Customer .04  
Classification compone=

in Reverse Star schema , for  
each customer profiling

Create Customer group and update profiling

\*10 keys in tables of...minimum documentation to the extent that such  
documents are included in the fields, searched Electronic data base  
consulted during the international search (name of data base and,  
where practicable, search terms used) Please See Extra Sheet.

EIC 3600

Dialog Search

SEARCHED DOCUMENTS CONSIDERED TO BE

...INTERNATIONAL SEARCH REPORT Int 'monal applicatior) No.

PCT/US00/01075

B. FM@DS SEARCHED

Electronic data bases consulted (Name of data base and where practicable terms used):

WEST

Search terms: Data Warehouse , meta-daw. cusomer profile, hierarchy, customer records. database table. business performance mcaures

Form PCT/ISA/210 (extra sheet) (Julv 1998)